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NOTICE OF ALLOWANCE AND FEE(S) DUE

23373 7590 04/16/2009

SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER

GERGISO, TECHANE

ART UNIT

PAPER NUMBER

2437

DATE MAILED: 04/16/2009

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/713,197	11/17/2003	Ji-Young Moon	Q77283	9563

TITLE OF INVENTION: IMAGE WATERMARKING METHOD USING HUMAN VISUAL SYSTEM

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	07/16/2009

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. **PROSECUTION ON THE MERITS IS CLOSED.** THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN **THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE** OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. **THIS STATUTORY PERIOD CANNOT BE EXTENDED.** SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

23373 7590 04/16/2009

SUGHRUE MION, PLLC
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WASHINGTON, DC 20037

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

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nonprovisional	NO	\$1510	\$300	\$0	\$1810	07/16/2009

EXAMINER	ART UNIT	CLASS-SUBCLASS
GERGISO, TECHANE	2437	713-176000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a **Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____
Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.**

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Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 689 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 689 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability

Application No.

10/713,197

Examiner

TECHANE J. GERGISO

Applicant(s)

MOON, JI-YOUNG

Art Unit

2437

- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to April 03, 2009.
2. ☒ The allowed claim(s) is/are 1-7 and 11.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some* c) ☐ None of the:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

1. This is a notice of allowance in response to the applicant's communication filed on April 03, 2009.

EXAMINER'S AMENDMENT

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.
3. Authorization for this examiner's amendment was given in a telephone call with S. Stuart Lee Reg. No.: 61, 124 on April 10, 2009; and the claims has been amended as follows:

LISTING OF CLAIMS:

1. (Currently amended): A moving image watermarking method using a human visual system, comprising the steps of:

- a) obtaining a watermark value by exclusive-ORing a random key value and a binary value of a logo image;
- b) separately performing a plurality of masking operations, wherein the plurality of the masking operations are separately performed on identical moving image data;
- c) obtaining a global masking value through the separately performed masking operations;

d) obtaining a watermarked frame value by adding the watermark value weighted by the global masking value and a control variable, to an original frame value; and

e) inserting a watermark into a moving image frame using the watermarked frame value;

~~wherein the step b) comprises the step of performing a motion masking operation.~~

2. (previously presented): The watermarking method according to claim 1, wherein the step b) further comprises the step of performing a spatial masking operation.

3. (previously presented): The watermarking method according to claim 2, wherein the performing the spatial masking operation comprises the steps of:

adjusting contrast of the moving image frame; and
extracting edges from the contrast-adjusted frame.

4. (Currently amended): The watermarking method according to claim 2, wherein ~~the~~ performing the a motion masking operation comprises the steps of:

obtaining a luminance difference between a current frame and a previous frame; and
extracting edges from the current frame.

5. (original): The watermarking method according to claim 2, wherein the step b) further comprises the step of performing a frequency masking operation.

6. (previously presented): A moving image watermarking method using a human visual system, comprising the steps of:

a) obtaining a watermark value by exclusive-ORing a random key value and a binary value of a logo image;

b) separately performing a plurality of masking operations;

c) obtaining a global masking value through the separately performed masking operations;

d) obtaining a watermarked frame value by adding the watermark value weighted by the global masking value and a control variable, to an original frame value;

e) inserting a watermark into a moving image frame using the watermarked frame value;

f) comparing an image quality of the watermarked frame with an image quality set to a target; and

g) decreasing the control variable by a predetermined value if the image quality of the watermarked frame is less than the target image quality, and increasing the control variable by a predetermined value if the image quality of the watermarked frame is greater than the target image quality.

7. (original): The watermarking method according to claim 6, wherein the image quality is estimated on the basis of Peak-Signal-to-Noise Ratio (PSNR).

8. (previously presented): The watermarking method according to claim 1, further comprising the step of f) extracting the watermark, the step f) comprising the steps of:

subtracting the watermarked frame value from the original frame value to obtain a subtracted result value; and exclusive-ORing the subtracted result value and a random variable obtained by a key value, and obtaining an exclusive-ORed result.

9-10. (canceled).

11. (Currently amended): A recording medium for storing computer programs for executing a moving image watermarking method using a human visual system, the moving image watermarking method comprising:

a) obtaining a watermark value by exclusive-ORing a random key value and a binary value of a logo image;

b) separately performing a plurality of masking operations, wherein the plurality of the masking operations are separately performed on identical moving image data;

c) obtaining a global masking value through the separately performed masking operations;

d) obtaining a watermarked frame value by adding the watermark value weighted by the global masking value and a control variable, to an original frame value; and

e) inserting a watermark into a moving image frame using the watermarked frame value;

~~wherein the step b) comprises the step of performing a motion masking operation.~~

12.-15. (canceled).

Reason for allowance

4. After consideration of the applicant's communication filed on April 03, 2009 in the After Final in response to the Final Office Action mailed on February 03, 2009, and through examination of claims 1-7 and 11; and further search, the claims have been found in condition for allowance over prior arts of record.

5. The following is an examiner's statement of reasons for allowance:

Claims 1, 6 and 11 include the following features which are not taught or further suggested and would not have been obvious over prior arts of record and these claimed features are: obtaining a watermark value by exclusive-ORing a random key value and a binary value of a logo image; separately performing a plurality of motion masking operations on identical moving image data; obtaining a global masking value through the separately performed motion masking operations; obtaining a watermarked frame value by adding the watermark value weighted by the global masking value and a control variable to an original frame value; and inserting a watermark into a moving image frame using the watermarked frame.

In light of the specification (see paragraphs 08 and 11), the step of "separately performing a plurality of masking operations" comprises the steps of performing a spatial

masking operation, and performing a motion masking operation, and may further comprise the step of performing a frequency masking operation.

The **spatial masking operation**: adjusting contrast of the moving image frame; and extracting edges from the contrast-adjusted frame (See applicant disclosure paragraph 0009).

The **motion masking operation**: obtaining a luminance difference between a current frame and a previous frame; and extracting edges from the current frame (See applicant disclosure paragraph 0010).

The **frequency masking operation**: is obtained on a DCT-based visual model of Watson by dividing an image into 8*8 blocks and calculating a frequency masking value using a frequency sensitivity table which is an experimentally measured quantity to represent a minimum DCT coefficient detected within a corresponding block when masking noise is not applied to the block with respect to each of blocks (See applicant disclosure paragraph 0032).

Prior art of record neither teaches nor suggests the above claim limitations.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Contact Information

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Techane J. Gergiso whose telephone number is (571) 272-3784 and fax number is (571) 273-3784. The examiner can normally be reached on 9:00am - 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Emmanuel Moise can be reached on (571) 272-3865. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Techane J. Gergiso/

Examiner, Art Unit 2437

/Emmanuel L. Moise/

Supervisory Patent Examiner, Art Unit 2437